O P I N I O N

on the materials for participation in a competition for the occupation of the academic position "professor", field of higher education 6. Agricultural sciences and veterinary medicine, PN 6.1. Crop Production, scientific specialty "**Agrochemistry**", in the discipline "Agrochemistry", announced by the University of Forestry in SG no. 59 /12.07.2024, procedure code AGR-P-0524-132

Candidate for participation in the competition: Associate Professor Veselin Iliev Kutev, DSc

Prepared the opinion: Prof. Dr. Svetla Stoyanova Kostadinova, professor of PN 6.1. Crop Production, scientific specialty "Agrochemistry" from Agricultural University of Plovdiv

1. Brief biographical data about the candidate

Associate Professor Veselin Iliev Kutev graduated with honors from the State Agrarian University "V. V. Dokuchaev", Kharkiv, Ukraine in 1987. In 1995, he defended his PhD thesis at IPAZR "Nikola Pushkarov" and in 2013 he defended his doctorate degree in the scientific specialty "Agrochemistry". Since 1987, he has been working at IPAZR "Nikola Pushkarov" Sofia as an agrochemist, doctoral student and associate professor. In the period 2012-2014, Assoc. Prof. Kutev headed the Bureau for the Transfer of Technological Solutions in Agriculture at the same institute. He works on a second employment contract as an associate professor at the Institute of Mathematics and Informatics, BAS, Sofia (2011-2012). Since 2014, he has held the academic position of Associate Professor of Agrochemistry at LTU, Sofia, where he was the Head of the Department of Agriculture and Herbology (2016-2019) and from 2024 he is the acting Head of the Department of Agronomy. Assoc. Prof. Kutev is fluent in English, French and Russian and he is competent in using various computer programs.

2. Conformity of the candidate's submitted documents and materials with those required according to the Regulations for RAS at LTU;

Assoc. Prof. Veselin Kutev has presented proven information on scientific-metric indicators according to the accepted groups of categories as follows:

Indicator A with min. requirements 50 points - Submitted materials for 50 points Compliance - 100%.

Group of indicators B with min. requirements 100 points - Submitted materials for 121.7 points.

Group of indicators Г with min. requirements 200 points - Submitted materials for 342.6 items or 1.7 times more than the required minimum.

Group of indicators Д with min. requirements 100 points - Submitted materials for 225 items or 2.25 times more than the required minimum.

Group of indicators E with minimum requirements 100 items - Presented materials for 425 points or 4.25 times more than the required minimum.

The submitted documents and materials of the candidate Assoc. Prof. Veselin Kutev indicate that they cover in Indicator A and exceed in Indicators B, Г, Д and E the requirements of the ZRASRB and the Regulations for the implementation of the ZRASRB of LTU, Sofia for participation in a competition for taking an academic "Professor" position in a professional field 6.1. Crop Production, scientific specialty "Agrochemistry".

3. Assessment of the candidate's educational and teaching activities

Assoc. Prof. Kutev has 10 years of teaching experience at the University of Forestry, Sofia. It develops a wide range of activities in the training of agronomic personnel. The candidate has developed 4 study programs for OKS Bachelor students in full-time and part-time study in the disciplines: "Agrochemistry" for the specialty Agronomy (7 credits), "Agrochemistry" for the specialty Plant Protection (7 credits), "General Crop Production" for the specialty Plant Protection (7 credits), " Crop Production " for Agronomy (10 credits). Assoc. Prof. Kutev is actively involved in the education of OKS Master's students. He has developed 7 curricula and leads the disciplines: "Agrotechnics and Fertilization" in MK Agriculture (4 credits), "Precision Agriculture" MK Agriculture (6 credits), "Soil Fertility Management" MK Agriculture (3 credits), "Management of organic residues" MK Regenerative Agriculture (4.5 credits), "Minimum and Zero Tillage" MK Regenerative Agriculture (6 credits), "Good Manure Management Practices" MK Sustainable Production of Forage Crops (2.5 credits), "Crop Fertilization in precision agriculture" MK Precision Agriculture (8 credits). Assoc. Prof. Kutev's role in training young people is also illustrated by the fact that under his supervision, 3 Bulgarian PhD students and one foreign PhD student from Lebanon successfully defended their doctoral dissertations. Assoc. Prof. Kutev is a co-author in the writing of a university textbook "Technology for fertigation in vegetable crops", published in 2019.

The brief analysis of the candidate's educational and teaching activities and the materials presented by Associate Professor Kutev indicate that he has made a significant contribution to the training of students and doctoral students in the field of agrochemistry and is respected by his colleagues and students.

4. Evaluation of the candidate's scientific, applied scientific and publication activity

4.1. Participation in scientific, scientific-applied and educational projects

Assoc. Prof. Kutev was the head of a total of 6 scientific projects, of which 4 were international scientific projects and 2 were national:

1. Coordinator for Bulgaria of a project from the EU's Sixth Framework Program - FOODCT-2004 003375 "OPENING CHANNELS IN COMMUNICATIONS BETWEEN THE ASSOCIATED CANDIDATE COUNTRIES AND THE EU IN ECOLOGICAL FARMING", 2004-2006.

2. Project financed by the Ministry of Foreign Affairs of Greece "HELLENIC – BULGARIAN COOPERATION FOR THE PROTECTION AND MANAGEMENT OF NATURAL RESOURCES", 2004 - 2006.

3. Project BUL/017/06 funded by the Flemish Government "IMPLEMENTATION OF FARM GATE NUTRIENT BALANCES IN BULGARIA: A MANAGEMENT TOOL TOWARDS SUSTAINABLE AGRICULTURE", 2007-2010.

4. Project to NFNI - Contract DNTS/Austria 01/2 dated 23.08.2017 "Distribution of nutrients in the soil during intensive cultivation of vegetables with fertigation and optimization of the nutritional regime of crops to reduce the impact of fertilizers on the environment.

5. Project at NFNI No. INOV_09_0004 on the topic "Study of the spatial variation of nutritional elements in the conditions of intensive production of vegetables using fertigation to optimize the nutrition of crops and reduce the impact of used fertilizers on the environment", 2011-2013. (national)

6. Contract No. 20 of 2016: "Movement of nitrates in the soil under conditions of fertigation with background mineral and organic fertilization of vegetables" (national).

The candidate participated as a team member in an international scientific project - Project: SEE/A/118/2.2/X MONITOR II Practical use of monitoring in natural disaster management. MONITOR II is supported by Means of the European Regional Development Fund (ERDF) - IMI, BAS - 2011-2012, and in a national scientific project of the "Scientific Research" Fund - Project H

26/16 of 03.09.2018 - Study of DNA markers related to productivity in sheep breeds bred in Bulgaria.

The project activity of Assoc. Prof. Kutev illustrates his active participation in studies related to soil fertility and fertilization in agricultural systems. All this contributes to a very good attestation of his research activity and his formation as a scientist in the field of agrochemistry.

4.2. Characteristics of published scientific results

The presented scientific publications indicate that the main research work of Associate Professor Kutev is in the field of agrochemistry. Main scientific problems on which the candidate has worked are related to optimization of fertilization in various agricultural crops (foreign and Bulgarian genotypes of wheat, rapeseed, sunflower, corn, barley, oats, zucchini, arugula, lettuce, lettuce, onion) and nutritional regime and monitoring of soil fertility (water pollution with nitrates, organic carbon content in light soils after fertilization with manure, immobilization of forms of nitrate and ammonium nitrogen in the soil, the spatial variability between phosphorus and potassium in the conditions of a permanent monitoring network, residual mineral nitrogen in soil, amounts of nitrogen potentially washed into the environment, changes in some agrochemical parameters during fertigation. The candidate uses modern methods such as map observations through satellite surveys, drone and multispectral camera, Trimble Green Seeker sensor, mathematical models, isotopic methods with labeled ammonium and nitrate nitrogen Assoc. Prof. Kutev has presented 13 publications in journals with SJR and IF, of which 5 articles are in journals with quartile Q3. The publications are very well designed, include a thorough literature justification, appropriate mathematical treatment of the results, a thorough analytical part and conclusions.

4.3. Reflection of the candidate's scientific activity in the literature (citability)

Assoc. Prof. Kutev has submitted 15 citations to three of his scientific publications for the current competition, which indicate the candidate's interest in the topic and scientific results. Citations are included in sub-indicator Д 13 Citations or reviews in scientific publications, referenced and indexed in world-renowned databases with scientific information or in monographs and collective volumes and in total carry 225 points per candidate with minimum national requirements for a professor under indicator Д of 100 points.

4.4. Contributions in the candidate's works (scientific, scientific-applied, applied)

More important scientific and scientific-applied contributions:

New scientific information has been obtained based on satellite studies for basic environmental parameters (B4.1, B4.2).

With a drone and a multispectral camera, the NDVI index and the condition of wheat and rapeseed crops were studied for the more accurate determination of nitrogen fertilizer rates in different parts of the field. The study is one of the first for Bulgaria (B4.5).

In the conditions of a field experiment with zucchini, the NDVI index was measured with a Trimble Green Seeker hand-held sensor and related to the applied nitrogen fertilizers and the phosphorus background (B4.11).

New data have been obtained about increased pollution of the waters in Bulgaria with nitrates during the last 20 years during the production of corn on alluvial soils (B4.9).

The scientific information for applying manure to light soil indicating a downward movement in the soil profile of soil organic carbon after two years has been updated (Г7.2).

When labeled ammonium and nitrate nitrogen were co-administered, nitrate nitrogen was shown to be immobilized from 2 to 11%, and ammonium nitrogen was immobilized from 42 to 77% (Г7.3).

The results of fertigation studies show that it is possible to make adjustments to applied

irrigation and fertilizer rates, as well as to the placement of irrigation lines to vegetable plants (Г7.4).

Significant leaching of soil organic carbon (below 90 cm) was found with fertigation two years after manure application on sandy alluvial soil (Г8.11).

Changes in soil moisture during the onion growing season under fertigation depend on irrigation, rainfall and root uptake. At the beginning of the season, EC results are largely related to low water and soil nutrient content, while later they are determined by fertigation treatments (Г8.12).

A permanent monitoring network of resin mills has been established. Spatial variability of P and K was found to depend on soil formation processes and parent rock, while differences in nitrogen were due to nitrogen fertilizer application (Г7.7).

A hundred old and modern soft wheat cultivars were studied without the use of fertilizers and it was found that Erythrospermum and Ferrugineum wheats were characterized by a low straw:grain ratio (1.51 - 1.52), while Milturum, Lutescens and Graecum wheats had a high ratio (1.80 - 1.94). Strong differences in the straw:grain ratio between the two selection centers in Bulgaria have been proven - in the varieties from Sadovo, the ratio is 2.18, and in General Toshevo it is 1.55. The presence of thistles is a factor of variation, with the straw:grain ratio for the thistle varieties being 1.53 and for the no-thistle varieties 1.88. Determination of NPK fertilizer rates is influenced by the straw:grain ratio of wheat. Nitrogen rates vary from 16.5 to 18.5 kg N, phosphorus rates from 6.5 to 7.5 kg P2O5 per decare. The rates for potassium fertilization vary the most from 14.5 to 19.3 kg K2O per hectare (Г8.1).

The effect of the factors "Variety type", "Nitrogen treatment" and "Place", as well as the relationships "Variety type x Place" and "Nitrogen treatment x Place" were established for 100 wheat varieties. It has been proven that in the conditions of the experimental field in Sofia, characterized by weaker soil and predecessor corn, most of the old varieties (18) are efficient and responsive to nitrogen fertilization, and most modern varieties (45) are ineffective and unresponsive to nitrogen. The opposite trend was observed in General Toshevo in conditions of leached chernozem and bean precursor (Г8.2).

The variation of fertilizer rates with the spatial heterogeneity of soil fertility at a resin mill was investigated for the application of precision agriculture. The results obtained for variable rate fertilization in barley and sunflower show that significant fertilizer savings can be made with nitrogen and potassium fertilizers. For barley, the nitrogen fertilizer rate varies from 6.5 to 11.0 kg/da, and the potassium rate from 1.0 to 7.5 kg/da. For sunflower, the nitrogen fertilizer rate varies from 1 to 9 kg/da, and the potassium rate from 1 to 9 kg/da. For both crops, the rate of phosphorus fertilization can be reduced by 50% or more, only on about 10% of the area (Г8.3).

New scientific information was obtained on the genetic architecture of plant height in a set of 358 European winter wheat and 14 spring wheat cultivars based on field data in eight countries (Г8.4).

The load with residual mineral nitrogen on the arable areas in North-West and North-Central Bulgaria was determined and the total amounts of nitrogen potentially washed into the environment during spring and winter crops were calculated. Average possible losses are up to 52 kgN/ha (Г7.8).

More important applied contributions:

In the conditions of a three-year crop rotation, the effective norms for nitrogen for sunflower (N12), wheat (N10) and corn (N10) kg/ha have been established. A similar influence of the single application of P36K36 to the annual P12K12 fertilization was demonstrated (Г7.5).

Orthophosphates have been shown to have a negative effect on dry matter accumulation in onions, while polyphosphates have a positive effect. The content of nitrates is higher in the variant with orthophosphates (Г7.12).

The effect of organic liquid fertilizer "Extra Force" on the yield of arugula and lettuce has

been proven (Г7.9)

An increase in yields and height of wheat plants was found at two applications of liquid organic fertilizers "Extra Force" and "Zinovy Korn" (Г7.16).

In a comparative study of organic liquid fertilizers and preparations "Eko Prop", "Biostar Top", StimAK, "Azarius" and "Ermey" for salad, a good effect on the productivity of the culture was found when using Azarius (Г8.17).

In a field fertilization experiment with lettuce, it was found that the combined use of nitrogen and phosphorus fertilizers increased the nitrate content of lettuce leaves, with the highest values reported in the combination of KSC and EUROFERTIL (168 mg.kg-1). Self-fertilization with nitrogen fertilizers and especially with ammonium nitrate leads to high levels of chlorophyll "a" and "b" and carotenes, in contrast to self-fertilization with phosphorus fertilizers, which lowers their levels in the leaves (Г8.18).

Initial research has been done on organic fertilizers based on alfalfa extracts with oats. Results for plant height after foliar fertilization showed the strongest effect for Sila Max, Sila and Sila B+Mo. The treatments with Sila Max, Sila B+Mo accumulated the largest mass. All studied fertilizers gave a statistically significant increase in oat yield and height (Г8.19).

New information was obtained on nitrogen, phosphorus and potassium contents in the main soils of Eastern Bulgaria. It is recommended that at 30 N/ha, this value should be excluded from the calculation of the nitrogen fertilizer rate. Phosphorus and potassium fertilization can be excluded at a content of more than 30 mg P2O5 and 35-40 mg K2O per 100 g of soil. Deterioration of soil fertility was found due to highly depleted phosphorus and average stock of potassium in soils (Г8.5).

5. Evaluation of the candidate's personal contribution

The personal contribution and participation of Assoc. Prof. Kutev in the presented 46 publications (sum of B4, Г7 and Г8) is illustrated by the fact that in 14 issues (30.4%) he is the lead author, in 12 issues (26.1%) he is the second author, in 5 issues (10.9%) is the third author, and 15 issues (32.6%) is the fourth and subsequent author. The publication activity of the candidate is mainly in English (71.7%). Assoc. Prof. Kutev is the first author of a monograph (Г5), independent author of 2 books based on a defended dissertation work for the awarding of the educational and scientific degree "Doctor" and for the awarding of the scientific degree "Doctor of Sciences" (Г6) and independent author of a chapter of a collective monograph (Г11). They are published in Bulgarian.

6. Critical notes and recommendations

I have no significant comments on the scientific production presented by Assoc. Prof. Kutev.

7. Personal impressions

My personal impressions of Veselin Kutev are that he is a built scientist and a good teacher, well known to agricultural specialists in our country. He knows how to work in a team, he is ethical and correct in his relations with his colleagues.

8. Conclusion

Based on the analysis of the candidate's pedagogical, scientific and scientific-applied activities, I consider that Associate Professor Veselin Iliev Kutev meets the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations of the University of Forestry for its application. The scientific production presented by him and his overall activity indicate that Associate Professor Kutev is a very well-prepared teacher and a

proven professional in the field of research work and **I SUGGEST the candidate ASSOCIATE PROFESSOR VESELIN ILIEV KUTEV, DSC to take the academic position of "professor" in the discipline "Agrochemistry" from PN 6.1. Crop Production.**

Prepared the opinion:
(Prof. Dr. Svetla Kostadinova)

The opinion has been forwarded to: 15.10.2024